

REMARKS

These remarks are in response to the Final Office Action dated October 11, 2006. The present Amendment places the application in condition for allowance for the reasons discussed herein; and does not raise any new issues requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution. Entry of the Amendment is respectfully requested.

Rejections Under 35 U.S.C. §112, first paragraph

Claims 1, 3, 9, 11-16 and 25-31 stand rejected under 35 U.S.C. §112, first paragraph, as purportedly failing to comply with the written description requirement. Applicants traverse.

At page 3, lines 13-14 of the Office Action, the Examiner asserts that "one of skill in the art cannot visualize or recognize the identity of the members of the claimed genus." This statement refers to the Examiners previous conclusion that the present specification fails to recite an amino acid sequence for a bacterial nitrile hydratase, and fails to provide a written description of additional nitrile hydratase enzymes and microorganisms "encompassed by the claimed genus in the amended claims." Finally, the Examiner states at page 3, lines 15-17, that "one of skill in the art would not recognize that the applicants were in possession of a genus of nitrile hydratase (sic) of any amino acid sequence and structure from any microorganism fungus body."

The above passages suggest that the Examiner has confused claims which recite "methods" of utilizing a nitrile hydratase to produce an amide compound, with those that claim "an isolated nitrile hydratase." Applicants respectfully submit that "method" claims are at issue in the pending claim set, not "composition" claims. The Examiners insistence that the instant specification should recite a specific nitrile hydratase, or microorganism containing such an enzyme, in order to support the pending method claims is not only inconsistent with current PTO policy but is also contrary to Federal Circuit case law. In support, Applicants respectfully point to the holding in Falker-Gunter Falkner v. Inglis (Fed. Cir. 2006, 05-1324) pertinent parts of which are discussed below.

In general, in order to satisfy the written description requirement of §112 the applicant must convey to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. According to the holding in Falker-Gunter, and consistent with previous Federal Circuit case law, there is no per se rule that an adequate written description of an invention that involves a biological macromolecule must contain a recitation of known structure. Thus, the recitation of a known nitrile hydratase structure in the instant claims, or even in the instant specification, is not required. As noted in previously filed Amendments, the present specification describes a nitrile hydratase and a microorganism fungus body at page 7, line 22 to page 10, line 5 of the specification as filed. This information, coupled with the knowledge of the skilled artisan, provides adequate support for method claims that utilize a nitrile hydratase. Neither the claims, nor the specification need be more specific with regard to, for example, the structure of a nitrile hydratases useful in the present methods because the skilled artisan already has such information in his/her possession. As the court stated in Capon:

“[t]he ‘written description’ requirement states that the patentee must describe the invention; it does not state that every invention must be described in the same way. As each field evolves, the balance also evolves between what is known and what is added by each inventive contribution.” 418 F.3d 1349, 1358 (Fed. Cir. 2005).

Indeed, the novelty of the present method lies not in the particular nitrile hydratase used in the method, but instead lies in the combination of conditions identified by the Applicants as suitable for purifying an amide compound. The forced recitation of a specific hydratase in the claims is in unnecessary limitation on the claimed method. Further, the forced recitation of known sequences in the instant disclosure would only add unnecessary bulk to the specification. Accordingly, accessible literature sources clearly provided, as of the relevant date, information about nitrile hydratase from various sources including those deposited in accessible repositories. While satisfaction of the written description requirement does not require either the recitation or incorporation by reference (where permitted) of such genes and sequences, the present specification clearly does so at, e.g., page 8, first full paragraph.

In addition, Applicants respectfully submit that exemplary US Patent No. 6,849,432 (the "'432 patent"; attached hereto as Appendix A) concerns a process for continuously producing an amide compound. The process includes reacting a microorganism fungus body containing nitrile hydratase or a processed product of the microorganism fungus body with a nitrile compound in an aqueous medium in a preceding reactor comprising a suspended bed, and subjecting a reaction solution thus obtained to reaction in a subsequent reactor under conditions having a plug flow region, wherein the reaction time in the preceding reactor is from 20% to 99% of the total reaction time, and the reaction time in the subsequent reactor is from 1% to 80% of the total reaction time (see e.g., claim 1).

That is, the process comprises reacting a microorganism fungus body with a nitrile compound, wherein the microorganism fungus body contains nitrile hydratase or a processed product of the microorganism fungus body and is used as an amidation catalyst for amidation of a nitrile group in a nitrile compound (see col. 3, lines 8 to 12 of the '432 patent). Applicants submit that the description of the nitrile hydratase and the microorganism fungus body provided in the '432 patent at col. 3, line 16 to col. 4 line 11 is virtually identical to the description provided at page 7, line 22 to page 10, line 5 of the instant specification for the same subject matter. Accordingly, it is unclear to the Applicants how the exemplary '432 patent succeeds in satisfying the written description requirement of §112 while the instant specification fails.

In light of the above, Applicants submit the claims are supported by the specification such that the skilled artisan would understand the inventors had possession of the invention at the time of filing. Applicants request that this rejection be withdrawn.

Rejections Under 35 U.S.C. §103

Claims 1, 3, 9, 11-16 and 25-31 stand rejected under 35 U.S.C. §103(a) as purportedly unpatentable over Oriel et al. (WO 99/55719) ("Oriel") in view of Chen. (*J Biol Chem.* 1967 Jan 25;242(2):173-81) ("Chen"). Applicants traverse this rejection.

The Examiner alleges that the process taught by Oriel, as modified by Chen, inherently removes impurities including, but not limited to, proteins. The Examiner

further alleges that the modified process involves not only contacting the solution with activated carbon, but also includes steps for concentrating or precipitating by distillation or evaporation the amide solution, thereby removing contaminating proteins.

Applicants respectfully aver that any rejection of the pending claims based on the combination of the cited references, in view of the instant disclosure, would constitute improper hindsight. Applicants submit that no specific understanding or principle within the knowledge of the skilled artisan would motivate one to combine the cited references in the absence of any knowledge of the instant disclosure. Even if the references were so combined, the skilled artisan would have no expectation of success in generating the claimed inventions in the absence of such knowledge.

The present claims are drawn to a method of purifying an amide compound by contacting a solution containing such a compound with activated carbon under acidic conditions. Such conditions are conducive to removing protein contaminants. The amide compound includes an unsaturated bond and is produced by contacting a nitrile compound with a nitrile hydratase, a microorganism fungus body containing nitrile hydratase or a processed product of the microorganism fungus body. Applicants were the first to discover that these conditions provide a purified compound with a high degree of reproducibility.

It is clear from the specification of Oriel that the cited reference fails to appreciate the significance of contacting the reaction solution with activated charcoal under acidic conditions in order to facilitate the purification of the amide compound as set forth in the pending claims. As noted in the present specification, utilizing charcoal treatment under the acidic conditions present in the amide solution provides an efficient and reproducible mechanism for removal of proteins. This treatment is preferable to the charcoal treatment under "neutral conditions" taught in Oriel. Thus, while the cited reference recites a purification mechanism, Oriel clearly fails to disclose any method that utilizes acidic conditions of the reaction solution to facilitate the controlled purification of an amide compound. Accordingly, this reference supplies neither the motivation to use activated charcoal in conjunction with an acidic environment to arrive at a method as set forth in the pending claims, nor any expectation of success if one were to attempt it.

Chen et al., has been cited for allegedly teaching acid-charcoal treatment of a solution in order to remove lipid impurities normally found in albumin. Applicants submit that the family of albumin proteins includes simple sulfur-containing, water soluble proteins (see Appendix B attached hereto and reproducing "The Random House Dictionary of the English Language" at page 49). Accordingly, the acid-charcoal treatment of Chen was performed in order to remove lipid impurities (fatty acid ester and the like) in proteins, and not for removing proteins in an amide compound-containing solution as set forth in the current claims.

The secondary reference fails to remedy the deficiencies of Oriel because Chen fails to suggest an acid charcoal treatment to remove proteins from a solution containing amide compounds. There is simply no motivation in either Oriel or Chen to experiment with pH conditions in order to generate a method suitable for purifying an amide compound under the acidic conditions set forth in the pending claims, and certainly no teaching that such experiments would have any likelihood of success.

As a result, the skilled person would be not motivated to modify Oriel to remove proteins from amide-containing reaction solution, based on the disclosure of removing lipid impurities from proteins by Chen. In light of the above discussion, Applicants request that the rejections under 35 U.S.C. § 103 be withdrawn.

CONCLUSION

It is respectfully submitted that all rejections have been overcome by the above amendments. Thus, Notice of Allowance is respectfully requested.

In the event that there are any questions relating to this Amendment or the application in general, it would be appreciated if the Examiner would contact the undersigned attorney by telephone at (858) 509-7318 so that prosecution of the application may be expedited.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY LLP

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By: _____



Michael Reed, Ph.D.
Registration No. 45,647

P.O. Box 1404
Alexandria, Virginia 22313-1404
(858) 509-7318